A-31

Activity and Ordering of Mixed Phosphatidylethanolamine/Dihydrocholesterol Monolayers

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Cholesterol is thought to be important for the structure and assembly of lipid rafts, and its interaction with other membrane lipids has been a topic of great research interest. The interactions between 1,2-dimyristoyl-sn-glycero-3-phosphoethanolamine (DMPE) and dihydrocholesterol (Dchol) in Langmuir monolayers are probed using fluorescence microscopy (FM), beta-cyclodextrin (CD) desorption assays, and grazing-incidence x-ray diffraction (GIXD). Similar to our previous results for 1,2-dimyristoyl-sn-glycero-3-phosphocholine (DMPC)/Dchol monolayers [1], FM and CD assays show two regimes for the DMPE/Dchol system. Short-ranged lateral ordering was observed using GIXD that was also consistent with our recent work on sphingomyelin (SM)/Dchol monolayers [2]. We investigate how the smaller headgroup of DMPE effects Dchol chemical activity and lateral structure compared to monolayers of Dchol with DMPC or SM.

1. *Biophys. J.*, 93, 2038–2047, (2007).
2. *Phys. Rev. Lett.*, **103,** 028103, (2009).